WHAT IS CLAIMED IS:

CLAIM 1. A method for determining optimal limits for products, comprising:

providing characterization data in a database for a first plurality of known good parts;

selecting a desired yield for said products;

selecting a proportion of said known good parts based upon said yield; and

utilizing a processor to obtain said characterization data for said proportion of known good parts to automatically determine specification limits for said product.

CLAIM 2. A method in accordance with claim 1, comprising:

partitioning said proportion of said known good parts into a first set and as second set; and

utilizing said characterization data for said first set to automatically determine said specification limits.

CLAIM 3. A method in accordance with claim 2, comprising

utilizing a scoring algorithm as part of said partitioning step.

CLAIM 4. A method in accordance with claim 2, wherein:

said partitioning step comprises utilizing an aggregate variability algorithm.

CLAIM 5. A method in accordance with claim 4, wherein:

said aggregate variability algorithm comprises; determining a magnitude of variation for each part parameter; dividing each magnitude of variation by a range of parameter values for all of said first plurality of parts to produce a scaled magnitude; and mathematically combining all of said scaled magnitudes for all of said parameters for a part.

CLAIM 6. A method in accordance with claim 5, wherein:

said magnitude variation step comprises determining the difference of the parameter minimum or maximum value and a mean of a part means for the parameter for a one-sided limit, and determining the greater difference of the parameter minimum and maximum values and a mean of the part means for the parameter for two-sided limits.

CLAIM 7. A method in accordance with claim 2, wherein:

said partitioning step comprises a margin from bound algorithm.

CLAIM 8. A method in accordance with claim 7, comprising:

calculating the difference between the minimum of a parameter value for a selected one of said plurality of parts and the least value of said corresponding parameter values for all of said plurality of parts, if a lower specification limit is to be determined; and

dividing said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 9. A method in accordance with claim 8, comprising:

calculating the difference between the maximum of a parameter value for a selected one of said plurality of parts and the greatest value of said corresponding parameter values for all of said plurality of parts, if an upper specification limit is to be determined; and

dividing said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 10. A method in accordance with claim 9, comprising:

calculating the difference between the minimum of a parameter value for a selected one of said plurality of parts and the least value of said corresponding parameter values for all of said plurality of parts;

calculating the difference between the maximum of a parameter value for said selected one of said plurality of parts and the greatest value of said corresponding parameter values for all of said plurality of parts;

selecting the lesser of the differences of the minimum and maximum parameter values if both upper and lower specification limits are to be determined; and

dividing said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 11. A method in accordance with claim 10, comprising:

mathematically combining all parameter scores for a part to produce a part score.

CLAIM 12. A method for determining specification limits for a product, comprising:

obtaining characterization data for a plurality of said product in accordance with a first algorithm;

identifying a set of known good ones of said product;

selecting a set of parameters for which specification limits are desired;

determining for each parameter of said set of parameters which of upper, lower, or upper and lower specification limits are to be obtained;

specifying a proportion of said set of known good one of said product to be used to determine product specification limits;

determining whether a sufficient number of said known good ones of said product have minimum and maximum test measurement data that are respectively above and below predetermined lower and upper product specifcation limits;

partitioning said sample of known good ones of said product into two subsets, a first one of said two subsets contains a sufficient number of ones of said product to at least meet said specified proportion;

said characterization data for said first one of said subsets being utilized to determine said specification limits.

CLAIM 13. A method in accordance with claim 1, wherein:

said product is a semiconductor device.

CLAIM 14. A system for use in determining specification limits for products, comprising:

a database for storing characterization data in a database for a first plurality of known good parts;

a processor operable to access said database and to operate on characterization data;

user input apparatus coupled to said processor to permit a user to select a desired yield for said products and a proportion of said known good parts based upon said yield; and

said processor being operable in accordance with a predetermined algorithm to automatically determine specification limits for said product from said characterization data for said proportion of known good parts.

CLAIM 15. A system in accordance with claim 14, comprising:

operating said processor to partition said proportion of said known good parts into a first set and as second set; and

said processor utilizing said characterization data for said first set to automatically determine specification limits for a product.

CLAIM 16. A system in accordance with claim 15, comprising

said processor utilizing a scoring algorithm as part of said partitioning step.

CLAIM 17. A method in accordance with claim 15, comprising:

said processor utilizing an aggregate variability algorithm to partition said known good parts.

CLAIM 18. A system in accordance with claim 17, wherein:

said aggregate variability algorithm comprises; determining a magnitude of variation for each part parameter; dividing each magnitude of variation by a range of parameter values for all of said first plurality of parts to produce a scaled magnitude; and mathematically combining all of said scaled magnitudes for all of said parameters for a part.

CLAIM 19. A system in accordance with claim 17, wherein:

said processor determines the difference of the parameter minimum or maximum value and a mean of a part means for the parameter for a one-sided limit, and determines the greater difference of the parameter minimum and maximum values and a mean of the part means for the parameter for two-sided limits.

CLAIM 20. A system in accordance with claim 15, wherein:

said processor utilizes a margin from bound algorithm to partition said known good parts.

CLAIM 21. A system in accordance with claim 20, comprising:

said processor being operated to calculate the difference between the minimum of a parameter value for a selected one of said plurality of parts and the least value of said corresponding parameter values for all of said plurality of parts, if a lower specification limit is to be determined; and

to divide said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 22. A system in accordance with claim 21, comprising:

said processor being operated to calculate the difference between the maximum of a parameter value for a selected one of said plurality of parts and the greatest value of said corresponding parameter values for all of said plurality of parts, if an upper specification limit is to be determined; and

to divide said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 23. A system in accordance with claim 22, comprising:

said processor being operated to calculate the difference between the minimum of a parameter value for a selected one of said plurality of parts and the least value of said corresponding parameter values for all of said plurality of parts;

to calculate the difference between the maximum of a parameter value for said selected one of said plurality of parts and the greatest value of said corresponding parameter values for all of said plurality of parts;

to select the lesser of the differences of the minimum and maximum parameter values if both upper and lower specification limits are to be determined; and

to divide said difference by the range of values of the corresponding parameter over all of said plurality of parts to produce a parameter score.

CLAIM 24. A system in accordance with claim 23, comprising:

said processor mathematically combining all parameter scores for a part to produce a part score.

CLAIM 25. A method for determining specification limits for a part, comprising:

collecting test data from a plurality of manufactured parts;

automatically utilizing said test data to identify known good parts;

selecting part parameters for which specification limits are to be calculated;

identify specification limit criteria;

determining a proportion of said plurality of manufactured parts;

automatically compare said plurality of parts against predetermined limits to identify a second plurality of manufactured parts;

determining whether said second plurality of manufactured parts provides said proportion;

partitioning said second plurality of manufactured parts to obtain a plurality of accepted parts;

utilizing test data from said plurality of accepted parts to determine specification limits for said part.

CLAIM 26. A system for determining specification limits for a part, comprising:

one or more processors operable to collect test data from a plurality of manufactured parts;

said or more processors automatically utilizing said test data to identify known good parts;

input apparatus coupled to said one or more processors to receive information *selecting part parameters for which specification limits are to be calculated and to receive* information determining a proportion of said plurality of manufactured parts;

said one or more processors being operated to automatically compare parameters of said plurality of parts against predetermined limits to identify a second plurality of manufactured parts and to determine whether said second plurality of manufactured parts provides said proportion;

said one or more processors automatically partitioning said second plurality of manufactured parts to identify a plurality of accepted parts; and

said one or more processors utilizing test data from said plurality of accepted parts to determine specification limits for said part.

CLAIM 27. A system in accordance with claim 26, wherein:

said part is a semiconductor device.

CLAIM 28. A method for characterization of manufactured parts, comprising:

automatically testing a plurality of parts to obtain characterization data;

automatically storing said characterization data for each of said plurality of parts in a database;

automatically identifying part parameters that do not meet design specifications;

determining if there are specific conditions that causes said part to be out of *specification*;

automatically modeling sensitivity of a parameter to an operating condition; and

identifying potential part issues.

CLAIM 29. A method in accordance with claim 28, comprising:

automatically computing a yield for said plurality of parts.

CLAIM 30. A method in accordance with claim 28, comprising:

utilizing an algorithm to identify outlier parts, said algorithm comparing each individual part to a composite of all other parts.

CLAIM 31. A method in accordance with claim 30, comprising:

calculating first and second percentiles and inter-quartile range for each parameter for each part;

calculating first and second medians for said first and second percentiles, respectively;

calculating the difference between said first and second percentiles;

calculating pseudo-whiskers;

utilizing said first and second medians, said difference and said pseudo-whiskers to identify outliers.